Official Draft Public Notice Version **May 24, 2016**
The findings, determinations, and assertions contained in this document are not final and subject to change following the public comment period.

FACT SHEET STATEMENT OF BASIS
DUCHESNE VALLEY WATER TREATMENT PLANT
RENEWAL PERMIT
UPDES PERMIT NUMBER: UT0025801
MINOR INDUSTRIAL

FACILITY CONTACTS

Chuck Hale, Facility Manager

(801) 785-5725

Mailing Address: P.O. Box 912
Duchesne, UT 84021

Facility Address: 23419 West State Park Road
Duchesne, UT 84021

DESCRIPTION OF FACILITY

Central Utah Water Conservancy District (District) owns and operates the Duchesne Valley Water Treatment Plant (DVWTP) located on the east side of Starvation Dam in Duchesne Utah. The DVWTP is a direct filtration water treatment plant that was constructed in the early 1980's. The original plant is designed to treat 8 million gallons. The plant process pumps raw water from Starvation Reservoir up to the treatment plant where aluminum sulfate (alum) or ferric chloride (ferric) is rapidly mixed with the raw water (coagulation) to neutralize the surface charge of particles found in the raw water. The raw water is then mechanically mixed (flocculation) to form larger floc particles which can then be removed in the next process (filtration). After the (duel media) filtration process, chlorine is mixed into the filtered water (disinfection). The high quality treated drinking water then enters finished water storage reservoirs to await delivery to the consumer.

Removing the potential harmful particles from the raw water is enhanced with the addition of a metal salt (alum or ferric), and then in the filtration process both particle and metal salt are collected in the filter. When the filter has collected or filtered a pre-determined amount material from the water, the filtration process is stopped, and clean drinking water is pumped in the reverse direction through the filter media to wash out all the collected particles within the filter. This (backwash) water then flows to one of two 1.1 million gallon drying/settling basins, where the backwash particles in the water settle out in the basin, and the clarified decant water flows, at a selected rate, from the top water level in the basin through adjustable gates and can then flow back to Starvation Reservoir at latitude 40° 11' 45" and longitude 110° 26' 10". The SIC code is 4941: Water Supply.

DISCHARGE

DESCRIPTION OF DISCHARGE

Outfall	Description of Discharge Point
001	Located at latitude 40° 11' 45" and longitude 110° 26' 10". The discharge is gravity flow through a 10-inch diameter pipe leading from the solids basin to Starvation Reservoir.

RECEIVING WATERS AND STREAM CLASSIFICATION

The discharge flows into the Starvation Reservoir. Starvation Reservoir is Class 1C, 2A, 2B, 3A, and 4, according to *Utah Administrative Code (UAC) R317-2-13*:

Class 1C - Protected for domestic purposes with prior treatment by treatment processes as required by the Utah Division of Drinking Water

Class 2A - Protected for frequent primary contact recreation where there is a high likelihood of ingestion of water or a high degree of bodily contact with the water. Examples include, but are not limited to, swimming, rafting, kayaking, diving, and water skiing.

Class 2B - Protected for infrequent primary contact recreation. Also protected for secondary contact recreation where there is a low likelihood of ingestion of water or a low degree of bodily contact with the water. Examples include, but are not limited to, wading, hunting, and fishing.

Class 3A - Protected for cold water species of game fish and other cold water aquatic life, including the necessary aquatic organisms in their food chain.

Class 4 - Protected for agricultural uses including irrigation of crops and stock watering.

BASIS FOR EFFLUENT LIMITATIONS

Limitations on total suspended solids (TSS), biochemical oxygen demand (BOD_5), and pH are based on current Utah Secondary Treatment Standards, *UAC R317-1-3.2*. Limits for Aluminum and Iron are based on the WLA. Limitations for Total Dissolved Solids (TDS) are based on the State Water Quality Standard for concentration, as well as the Colorado River Basin Salinity Control Forum (CRBSCF) for loading, as authorized in *UAC R317-2-4*. Discharges from the permittee eventually reach the Colorado River, which places it under the guidance of the CRBSCF. Total dissolved solids are limited in loading by the CRBSCF and in February 1977 they produced the *"Policy For Implementation of Colorado River Salinity Standards Through the NPDES Permit Program"* (Policy). This Policy is still in effect, and recently updated in October 2014. The permittee will be an intermittent discharger, discharging less than 366 tons TDS per year total. Therefore, the effluent will be limited to a maximum discharge of 1.0 ton per day TDS or 366 tons per year if the 1 ton/day limitation cannot be met. It is the responsibility of the permittee to maintain annual TDS loading information and submit it to the Director. The permit limitations are:

Parameter	Effluent Limitations a/			
	30 - Day Average	Maximum 7 - Day Average	Daily Minimum	Daily Maximum
BOD_5, mg/L	25	35	NA	NA
Total Suspended Solids, mg/L	25	35	NA	NA
Total Dissolved Solids, mg/L	NA	NA	NA	1200
Total Dissolved Solids, tons/day	NA	NA	NA	1.0
pH, Standard Units	NA	NA	6.5	9.0
Aluminum, mg/l e/	3.89	NA	NA	7.24
Aluminum, lbs/day e/	3.2	NA	NA	6.0
Iron, mg/L f/	NA	NA	NA	0.168
Iron, lbs/day f/	NA	NA	NA	0.1
WET, Chronic Biomonitoring	NA	NA	NA	IC_{25} > 10.1% of Effluent

NA – Not Applicable

SELF-MONITORING AND REPORTING REQUIREMENTS

The following self-monitoring requirements are similar to the previous permit. The permit will require reports to be submitted monthly and annually, as applicable, on Discharge Monitoring Report or NetDMR (DMR) no later than the 28th day of the month following the completed reporting period. Lab sheets for biomonitoring must be attached to the biomonitoring DMR.

Self-Monitoring and Reporting Requirements a/			
Parameter	Frequency	Sample Type	Units
Total Flow b/	Continuous	Recorder	MGD
BOD_5	Monthly	Grab	mg/L
Total Suspended Solids	Monthly	Grab	mg/L
Total Dissolved Solids c/	Monthly	Grab	mg/L, tons/day
WET, Chronic Biomonitoring d/	Quarterly	Composite	Pass/Fail
Aluminum e/	Monthly	Grab	mg/L
Iron f/	Monthly	Grab	mg/L
pH	Weekly	Grab	SU

a/ See Definitions, *Part I*, for definition of terms.

b/ If the rate of discharge is controlled, the rate and duration of discharge shall be reported.

c/ In addition to the total dissolved solids (TDS) effluent concentration limitation, TDS effluent loading is limited to one-ton/day. If the one-ton/day effluent loading limitation cannot be met, then the permittee is limited to 366-tons/year total TDS effluent loading from the facility. It is the responsibility of the permittee to maintain annual TDS loading information and upon request the permittee shall submit to the Director the annual TDS loading information.

d/ The Chronic toxicity occurs when the IC_{25} is observed for either test species at greater than 10.1% effluent dilution.

e/ Aluminum will not need to be monitored if there is no Alum used in the treatment process.

f/ Iron will not need to be monitored if there is no Ferric Chloride used in the treatment process.

WASTE LOAD ANALYSIS AND ANTIDEGRADATION REVIEW

Effluent limitations are also derived using a waste load analysis (WLA), which is appended to this statement of basis. The WLA incorporates Secondary Treatment Standards, Water Quality Standards, Antidegradation Reviews (ADR), as appropriate, and designated uses into a water quality model that projects the effects of discharge concentrations on receiving water quality. Effluent limitations are those that the model demonstrates are sufficient to meet State water quality standards in the receiving waters.

During the UPDES permit development, a WLA and ADR were performed. An ADR Level I review was performed and the conclusion was that an ADR level II review was required. DVWTP completed an ADR on April 13, 2010. Since DVWTP has not changed any treatment processes or increased the flow, a new ADR is not required.

STORM WATER

The facility's SIC code is 4941: Water Supply, there is no bulk storage of any contaminants at the facility. Therefore, a storm water industrial UPDES permit is not required. A storm water re-opener provision is included in the permit should storm water requirements become necessary in the future.

PRETREATMENT REQUIREMENTS

There is no discharge of process wastewater to any municipal wastewater treatment facility. Any process wastewater that the facility may discharge to the public sanitary sewer, either as direct discharge or as a hauled waste, is subject to federal, state and local pretreatment regulations. Pursuant to section 307 of the Clean Water Act, the permittee shall comply with all applicable Federal General Pretreatment Regulations promulgated in 40 CFR Section 403, the State Pretreatment Requirements found in UAC R317-8-8, and any specific local discharge limitations developed by the Publicly Owned Treatment Works (POTW) accepting the waste.

In addition, in accordance with *40 CFR 403.12(p)(1)*, the permittee must notify the POTW, the EPA Regional Waste Management Director, and the State hazardous waste authorities, in writing, if they discharge any substance into a POTW which if otherwise disposed of would be considered a hazardous waste under *40 CFR 261*. This notification must include the name of the hazardous waste, the EPA hazardous waste number, and the type of discharge (continuous or batch).

BIOMONITORING REQUIREMENTS

A nationwide effort to control toxic discharges where effluent toxicity is an existing or potential concern is regulated in accordance with the *State of Utah Permitting and Enforcement Guidance Document for Whole Effluent Toxicity Control (biomonitoring)*. Authority to require effluent biomonitoring is provided in *Permit Conditions, UAC R317-8-4.2, Permit Provisions, UAC R317-8-5.3* and *Water Quality Standards, UAC R317-2-5* and *R317 -2-7.2*.

The renewal permit will require Whole Effluent Toxicity (WET) testing. Acute toxicity testing will no longer be required, as there were no violations of the acute biomonitoring limit during the previous permit period. Chronic toxicity tests will be conducted quarterly, alternating between Ceriodaphnia dubia and Pimephales promelas (fathead minnows) species, as detailed in the permit. Alternating species has been previously granted to the permittee, and will continue in this permit renewal as well, based upon the absence of confirmed toxicity and the permitting authorities best professional judgment.

The permit will contain the standard requirements for a TRE (Toxicity Reduction Evaluation) as necessary. The permit will also contain a toxicity limitation re-opener provision. This provision allows for modification of the permit at any time to include WET limitations and/or increased WET monitoring, should additional information indicate the presence of toxicity in the discharge.

PERMIT DURATION

It is recommended that this permit be effective for a duration of five (5) years.

Drafted by
Matthew Garn, P.E.
Utah Division of Water Quality
February 9, 2016

PUBLIC NOTICE

Began:
Ended:
Public Noticed in The Vernal Express
DWQ-2016-009667

ATTACHMENT 1

Wasteload Analysis

WASTELOAD ANALYSIS [WLA]
Addendum: Statement of Basis
SUMMARY

Discharging Facility:	**Starvation WTP**		
UPDES No:	UT0025801		
Current Flow:	0.10	MGD	Design Flow
Design Flow	0.10	MGD	

Receiving Water:	**Starvation Reservoir**	
Lake Classification:	1C, 2A, 3A, 4	
TDS (mg/l)	385.00	Average
Hardness (mg/l)	300.00	Average
pH	7.70	Average
Temp (C)	13.5	Average

Selected Effluent Limit Summary:			**WQ Standard:**	
Flow, MGD:	0.10	MGD	Design Flow	
BOD, mg/l:	25.0	All Season	5	Indicator
Dissolved Oxygen, mg/l:	5.00	All Season	6.50	30 Day Average
TNH3, Chronic, mg/l:	434.17	All Season	Varies	Function of pH and Temperature
TDS, mg/l:	8431.75	All Season	1200	
Zinc, ug/l	2115.80	All Season	Varies	Function of Hardness
Copper, ug/l	256.56	All Season	Varies	Function of Hardness

Modeling Parameters:

Acute Dilution Ratio	9.87 to 1
Chronic Dilution Ratio:	56.42 to 1

Level 1 Antidegradation Level Completed: Level II Review required -Discharge to a 1C water

Date: 7/17/2015

Permit Writer:		
WLA by:	David McCann	7/17/15
WQM Sec. Approval:		
TMDL Sec. Approval:		

Wasteload Analysis - Total Maximum Daily Load (Lake TMDL)

7/17/2015 14:55

Facility: **Starvation WTP** **UPDES No: UT- UT0025801**
Discharging to: **Starvation Reservoir**

I. Introduction

Wasteload analyses are performed to determine point source effluent limitations necessary to maintain designated beneficial uses by evaluating projected effects of discharge concentrations on lake water quality. The wasteload analysis does not take into account downstream designated uses [R317-2-8, UAC]. Projected concentrations are compared to numeric water quality standards to determine acceptability. The anti-degradation policy and procedures are also considered. The primary water quality parameters of concern may include metals (as a function of hardness), total dissolved solids (TDS), total residual chlorine (TRC), unionized ammonia (as a function of pH and temperature, measured and evaluated interms of total ammonia), and dissolved oxygen.

Mathematical water quality modeling is employed to determine water quality response to point source discharges. Models aid in the effort of anticipating water quality at future effluent flows at critical environmental conditions (e.g., high temperature, high pH, etc).

The numeric criteria in this wasteload analysis may be modified by narrative criteria and other conditions as determined by staff of the Division of Water Quality.

II. Receiving Water and Lake / Reservoir Classification

Starvation Reservoir 1C, 2A, 3A, 4

III. Numeric Water Quality Standards for Protection of Aquatic Wildlife

Total Ammonia (TNH3)	Function of Temperature and pH	pH	Temp
	7.09 mg/l as N (4 Day Average)	2.31	13.5
	39.00 mg/l as N (1 Hour Average	2.35	13.5
Chronic Total Residual Chlorine (TRC)	0.011 mg/l (4 Day Average)		
	0.019 mg/l (1 Hour Average)		
Chronic Dissolved Oxygen (DO)	6.50 mg/l (30 Day Average)		
	5.00 mg/l (7Day Average)		
	4.00 mg/l (1 Day Average		
Maximum Total Dissolved Solids [Class 4 Ag]	1200 mg/l		
Maximum Boron [Class 4 Ag]	750 mg/l		

Acute and Chronic Heavy Metals (Dissolved)

Parameter	4 Day Average (Chronic) Standard Concentration		1 Hour Average (Acute) Standard Concentration	
Aluminum	87.000	ug/l	750	ug/l
Antimony		ug/l		ug/l
Arsenic	190.000	ug/l	360.00	ug/l

Asbestos	ug/l		ug/l
Barium	ug/l	1000.00	ug/l
Beryllium	ug/l		ug/l
Cadmium	0.472 ug/l	4.74	ug/l
Chromium III	159.218 ug/l	3331.15	ug/l
ChromiumVI	11.000 ug/l	16.00	ug/l
Copper	17.700 ug/l	28.37	ug/l
Cyanide	5.200 ug/l	22.00	ug/l
Iron	ug/l	1000.00	ug/l
Lead	8.261 ug/l	211.98	ug/l
Mercury	0.012 ug/l	2.40	ug/l
Nickel	166.34 ug/l	884.52	ug/l
Selenium	5.000 ug/l	20.00	ug/l
Silver	ug/l	13.74	ug/l
Thallium			
Zinc	226.108 ug/l	226.11	ug/l
Based upon a Hardness of 211.6 mg/l as CaCO3		Based upon 219.12 mg/l as CaCO3	

Organics [Pesticides]

Parameter	4 Day Average (Chronic) Standard Concentration	1 Hour Average (Acute) Standard Concentration	
Aldrin		1.500	ug/l
Chlordane	0.0043 ug/l	1.200	ug/l
DDT, DDE	0.001 ug/l	0.550	ug/l
Dieldrin	0.0056 ug/l	0.240	ug/l
Endosulfan, a & b	0.056 ug/l	0.110	ug/l
Endrin	0.036 ug/l	0.086	ug/l
Guthion			
Heptachlor & H. epoxide	0.0038 ug/l	0.260	ug/l
Lindane	0.08 ug/l	1.000	ug/l
Methoxychlor		0.030	ug/l
Mirex		0.001	ug/l
Parathion	0.0130 ug/l	0.066	ug/l
PCB's	0.014 ug/l		
Pentachlorophenol	15.00 ug/l	19.000	ug/l
Toxephene	0.0002 ug/l	0.730	ug/l

IV. Numeric Water Quality Standards for Protection of Agriculture

	1 Hour Average (Acute) Standard Concentration	
TDS	1200	mg/l
Arsenic	100	ug/l
Boron	750	ug/l
Cadmium	10	ug/l
Chromium	100	ug/l
Copper	200	ug/l
Lead	100	ug/l
Selenium	50	ug/l

V. Numeric Water Quality Standards for Protection of Human Health (Class 1C Waters)

Metals	1 Hour Average (Acute) Standard Concentration	
Arsenic	10	ug/l
Barium	1000	ug/l

Cadmium	10	ug/l
Chromium	50	ug/l
Lead	15	ug/l
Mercury	2	ug/l
Selenium	50	ug/l
Silver	50	ug/l
Fluoride (3)	1400	ug/l
to	2400	ug/l
Nitrates as N	10000	ug/l
Chlorophenoxy Herbicides		
2,4-D	0	ug/l
2,4,5-TP	0	ug/l
Methoxychlor	0	ug/l

VI. Numeric Water Quality Standards the Protection of Human Health from Water & Fish Consumption [Toxics]

	Maximum Conc., ug/l - Acute Standards	
	Class 1C	**Class 3A, 3B, 3C, 3D**
	[2 Liters/Day for 70 Kg Person over 70 Yr.	[6.5 g for 70 Kg Person over 70 Y
Antimony	5.6 ug/l	640 ug/l
Arsenic	A	A
Beryllium	C	C
Cadmium	C	C
Chromium III	C	C
Chromium VI	C	C
Copper	1,300 ug/l	
Lead	C	C
Mercury	A	A
Nickel	100 ug/l	4,600 ug/l
Selenium	A	4,200 ug/l
Silver		
Thallium	0.24 ug/l	6.3 ug/l
Zinc	7400 ug/l	26,000 ug/l
Cyanide	140 ug/l	220,000 ug/l
Asbestos	7.00E+06 Fibers/L	
2,3,7,8-TCDD Dioxin	5.0 E-9 ug/l	5.1 E-9 ug/l
Acrolein	190 ug/l	290 ug/l
Acrylonitrile	0.051 ug/l	0.25 ug/l
Alachlor	2 ug/l	
Benzene	2.2 ug/l	51 B ug/l
Bromoform	4.3 ug/l	140.00 ug/l
Carbofuran	40	
Carbon Tetrachloride	0.23 ug/l	1.60 ug/l
Chlorobenzene	100 ug/l	21,000 ug/l
Chlorodibromomethane	0.4 ug/l	13.00 ug/l
Chloroethane		
2-Chloroethylvinyl Ether		
Chloroform	5.7 ug/l	470.00 ug/l
Dalapon	200 ug/l	
Di(2ethylhexl)adipate	400 ug/l	
Dichlorobromopropane	0.2	

Dichlorobromomethane	0.55 ug/l		17.00 ug/l
1,1-Dichloroethane			
1,2-Dichloroethane	0.38 ug/l		37.00 ug/l
1,1-Dichloroethylene	7 ug/l		3.20 ug/l
Dichloroethylene (cis-1,2)	70		
Dinoseb	7		
Diquat	20		
1,2-Dichloropropane	0.5 ug/l		15.00 ug/l
1,3-Dichloropropene	0.34 ug/l		1,700 ug/l
Endothall	100		
Ethylbenzene	530 ug/l		29,000 ug/l
Ethyldibromide	0.05 ug/l		
Glyphosate	700 ug/l		
Haloacetic acids	60 ug/l	E	
Methyl Bromide	47 ug/l		1,500 ug/l
Methyl Chloride	F		F
Methylene Chloride	4.6 ug/l		590.00 ug/l
Ocamyl (vidate)	200 ug/l		
Picloram	500 ug/l		
Simazine	4 ug/l		
Styrene	100 ug/l		
1,1,2,2-Tetrachloroethane	0.17 ug/l		4.00 ug/l
Tetrachloroethylene	0.69 ug/l		3.30 ug/l
Toluene	1000 ug/l		200,000 ug/l
1,2 -Trans-Dichloroethylene	100 ug/l		140,000 ug/l
1,1,1-Trichloroethane	200 ug/l		F
1,1,2-Trichloroethane	0.59 ug/l		16.00 ug/l
Trichloroethylene	2.5 ug/l		30.00 ug/l
Vinyl Chloride	0.025 ug/l		530.00 ug/l
Xylenes	10000 ug/l		
2-Chlorophenol	81 ug/l		150 ug/l
2,4-Dichlorophenol	77 ug/l		290 ug/l
2,4-Dimethylphenol	380 ug/l		850 ug/l
2-Methyl-4,6-Dinitrophenol	13 ug/l		280 ug/l
2,4-Dinitrophenol	69 ug/l		5,300 ug/l
2-Nitrophenol			
4-Nitrophenol			
3-Methyl-4-Chlorophenol			
Penetachlorophenol	0.27 ug/l		3.00 ug/l
Phenol	21000 ug/l		1,700,000 ug/l
2,4,6-Trichlorophenol	1.4 ug/l		2.40 ug/l
Acenaphthene	670 ug/l		990 ug/l
Acenaphthylene	ug/l		ug/l
Anthracene	8300 ug/l		40,000 ug/l
Benzidine	0.000086 ug/l	B	0.00 ug/l
BenzoaAnthracene	0.0038 ug/l		0.02 ug/l
BenzoaPyrene	0.0038 ug/l		0.02 ug/l
BenzobFluoranthene	0.0038 ug/l		0.02 ug/l
BenzoghiPerylene	ug/l		
BenzokFluoranthene	0.0038 ug/l		0.02 ug/l
Bis2-ChloroethoxyMethane	ug/l		
Bis2-ChloroethylEther	0.03 ug/l		0.53 ug/l
Bis2-Chloroisopropy1Ether	1400 ug/l		65,000 ug/l
Bis2-EthylbexylPhthalate	1.2 ug/l		2.20 ug/l

4-Bromophenyl Phenyl Ether	ug/l		
Butylbenzyl Phthalate	1500 ug/l		1,900 ug/l
2-Chloronaphthalene	1000 ug/l		1,600 ug/l
4-Chlorophenyl Phenyl Ether	ug/l		
Chrysene	0.0038 ug/l		0.02 ug/l
Dibenzoa, hAnthracene	0.0038 ug/l		0.02 ug/l
1,2-Dichlorobenzene	420 ug/l		17,000 ug/l
1,3-Dichlorobenzene	320 ug/l		960 ug/l
1,4-Dichlorobenzene	63 ug/l		2,600 ug/l
3,3-Dichlorobenzidine	0.021 ug/l		0.03 ug/l
Diethyl Phthalate	17000 ug/l		44,000 ug/l
Dimethyl Phthalate	270000 ug/l		1,100,000 ug/l
Di-n-Butyl Phthalate	2000 ug/l		4,500 ug/l
2,4-Dinitrotoluene	0.11 ug/l		3.40 ug/l
2,6-Dinitrotoluene	ug/l		
Di-n-Octyl Phthalate	ug/l		
1,2-Diphenylhydrazine	0.036 ug/l		0.20 ug/l
Fluoranthene	130 ug/l		140.00 ug/l
Fluorene	1100 ug/l		5,300 ug/l
Hexachlorobenzene	0.00028 ug/l		0.00029 B ug/l
Hexachlorobutedine	0.44 ug/l		18.00 ug/l
Hexachloroethane	1.4 ug/l		3.30 ug/l
Hexachlorocyclopentadiene	40 ug/l		17,000 ug/l
Ideno 1,2,3-cdPyrene	0.0038 ug/l		0.02 ug/l
Isophorone	35 ug/l	B	960.00 ug/l
Naphthalene			
Nitrobenzene	17 ug/l		690 ug/l
N-Nitrosodimethylamine	0.00069 ug/l		3.00 ug/l
N-Nitrosodi-n-Propylamine	0.005 ug/l		0.51 ug/l
N-Nitrosodiphenylamine	3.3 ug/l		6.00 ug/l
Phenanthrene			
Pyrene	830 ug/l		4,000 ug/l
1,2,4-Trichlorobenzene	260 ug/l		940 ug/l
Aldrin	0.000049 ug/l		0.000050 ug/l
alpha-BHC	0.0026 ug/l		0.00 ug/l
beta-BHC	0.0091 ug/l		0.02 ug/l
gamma-BHC (Lindane)	0.2 ug/l		0.06 ug/l
delta-BHC			
Chlordane	0.0008 ug/l		0.00 ug/l
4,4-DDT	0.00022 ug/l		0.00 ug/l
4,4-DDE	0.00022 ug/l		0.00 ug/l
4,4-DDD	0.00031 ug/l		0.00 ug/l
Dieldrin	0.000052 ug/l	B	0.000054 ug/l
alpha-Endosulfan	62 ug/l		89 ug/l
beta-Endosulfan	62 ug/l		89 ug/l
Endosulfan Sulfate	62 ug/l		89 ug/l
Endrin	0.059 ug/l		0.81 ug/l
Endrin Aldehyde	0.29 ug/l		0.30 ug/l
Heptachlor	0.000079 ug/l	B	0.000079 ug/l
Heptachlor Epoxide	0.000039 ug/l	B	0.000039 ug/l
Polychlorinated Biphenyls	0.000064 ug/l	B,D	0.000064 ug/l
Toxaphene	0.00028 ug/l		0.00028 ug/l

There are additional standards that apply to this receiving water, but were not considered in this modeling/waste load allocation analysis.

VII. Mathematical Modeling of Water Quality Quality

Model configuration was accomplished utilizing standard modeling procedures. Data points were plotted and coefficients adjusted as required to match observed data as closely as possible.

The modeling approach used in this analysis included one or a combination of the following models.

(1) The Utah River Model, Utah Division of Water Quality, 1992. Based upon STREAMDO IV (Region VIII) and Supplemental Ammonia Toxicity Models; EPA Region VIII, Sept. 1990 and

QUAL2E (EPA, Athens, GA).

(2) Utah Ammonia/Chlorine Model, Utah Division of Water Quality, 1992.

(3) Principles of Surface Water Quality Modeling and Control. Robert V. Thomann, et.al. Harper Collins Publisher, Inc. 1987, pp. 644.

Coefficients used in the model were based, in part, upon the following references:

(1) Rates, Constants, and Kinetics Formulations in Surface Water Quality Modeling. Environmental Research Laboratory, Office of Research and Development, U.S. Environmental Protection Agency, Athens Georgia. EPA/600/3-85/040 June 1985.

(2) Principles of Surface Water Quality Modeling and Control. Robert V. Thomann, et.al. Harper Collins Publisher, Inc. 1987, pp. 644.

The Utah Reservoir and Lake Model is a simple round jet model which was received from EPA Region 8. It assumes a discharge expands into the receiving water as a 1/2 cone from the point of discharge with the appropriate dilution.

The dilution ratios for this wasteload analysis are as follows:

Acute Dilution Ratio:	**9.9 to 1**
Chronic Dilution Ration:	**56.4 to 1**

VIII. Modeling Information

The required information for the model may include the following information for both the lake and effluent conditions:

Temperature, Deg. C.	Total Residual Chlorine (TRC), mg/l
pH	Total NH3-N, mg/l
BOD5, mg/l	Total Dissolved Solids (TDS), mg/l
Metals, ug/l	Toxic Organics of Concern, ug/l

D.O. mg/l

Other Conditions

In addition to the lake and effluent conditions, the models require a variety of physical and biological coefficients and other technical information. In the process of actually establishing the permit limits for an effluent, values are used based upon the available data, model calibration, literature values, site visits and best professional judgement.

Model Inputs

Lake Information	Temp. Deg. C	pH	T-NH3 mg/l as N	BOD mg/l	DO mg/l	TRC mg/l	TDS mg/l	Metals ug/l
	13.5	2.3	0.00	N/A	N/A	0.00	385.0	0.0

	Season	Flow,	Temp.
Discharge Information	All Seasons	0.1	13.5

IX. Effluent Limitations based upon Water Quality Standards

Effluent Limitation for Flow

All Seasons

Not to Exceed:	0.10 MGD	Daily Average
	0.15 cfs	Daily Average

WET Requirements: As determined by Permits & Compliance Branch

Effluent Limitation for Biological Oxygen Demand (BOD)

	Concentration
30 Day Average	25.0 mg/l as BOD5
30 Day Average	20.0 mg/l as CBOD5

Effluent Limitation for Dissolved Oxygen (DO)

	Concentration 1 Day Average (Acute)
30 Day Average	5.00 mg/l

Effluent Limitation for Total Ammonia

	4 Day Average [Chronic]	
	Concentration	**Load**

All Seasons	434.17 mg/l as N	362.0 lbs/day

1 Hour Average [Acute] Concentration	Load
390.6 mg/l as N	325.7 lbs/day

Effluent Limitation for Total Residual Chlorine

	4 Day Average [Chronic] Concentration	Load
All Seasons	0.621 mg/l	0.5 lbs/day

1 Hour Average [Acute] Concentration	Load
0.188 mg/l	0.2 lbs/day

Effluent Limitations for Metals

	4 Day Average (Chronic) Concentration	Load	1 Hour Average (Acute) Concentration	Load
Aluminum	3894.28 ug/l*	2.1 lbs/day	7242.61 ug/l	3.9 lbs/day
Arsenic	8252.25 ug/l	4.4 lbs/day	3323.21 ug/l*	1.8 lbs/day
Barium			9873.32 ug/l	5.3 lbs/day
Cadmium	12.27 ug/l*	0.0 lbs/day	40.83 ug/l	0.0 lbs/day
Chromium III	5519.41 ug/l*	3.0 lbs/day	10341.51 ug/l	5.6 lbs/day
ChromiumVI	411.12 ug/l	0.2 lbs/day	124.43 ug/l*	0.1 lbs/day
Copper	825.67 ug/l	0.4 lbs/day	256.56 ug/l*	0.1 lbs/day
Cyanide	51.34		217.21	
Iron			168.41 ug/l	0.1 lbs/day
Lead	182.38 ug/l*	0.1 lbs/day	1459.40 ug/l	0.8 lbs/day
Mercury	0.51 ug/l*	0.000 lbs/day	23.67 ug/l	0.0 lbs/day
Nickel	4169.22 ug/l*	2.2 lbs/day	8758.97 ug/l	4.7 lbs/day
Selenium	195.80 ug/l	0.1 lbs/day	171.46 ug/l*	0.1 lbs/day
Silver			90.06 ug/l	0.0 lbs/day
Zinc	92442.18 ug/l	49.8 lbs/day	2115.80 ug/l*	1.1

* Most stringent between Chronic & Acute Effluent Limitations

Effluent Limitations for Organics [Pesticides]

Pesticide	4 Day Average Concentration	Load	1 Hour Average Concentration	Load
Aldrin			14.8100 ug/l	0.008 lbs/day
Chlordane	0.2426 ug/l*	0.000 lbs/day	11.8480 ug/l	0.006 lbs/day
DDT, DDE	0.0564 ug/l*	0.000 lbs/day	5.4303 ug/l	0.003 lbs/day
Dieldrin	0.3159 ug/l*	0.000 lbs/day	2.3696 ug/l	0.001 lbs/day
Endosulfan	3.1595 ug/l	0.002 lbs/day	1.0861 ug/l*	0.001 lbs/day

Endrin	2.0311 ug/l	0.001 lbs/day	0.8491 ug/l*	0.000 lbs/day
Guthion			0.0000 ug/l	0.000 lbs/day
Heptachlor	0.2144 ug/l*	0.000 lbs/day	2.5671 ug/l	0.001 lbs/day
Lindane	4.5135 ug/l*	0.002 lbs/day	9.8733 ug/l	0.005 lbs/day
Methoxychlor			0.2962 ug/l	0.000 lbs/day
Mirex			0.0099 ug/l	0.000 lbs/day
Parathion			0.6516 ug/l	0.000 lbs/day
PCB's	0.7899 ug/l	0.000 lbs/day	0.0000 ug/l*	0.000 lbs/day
Pentachlorophenol	846.2844 ug/l	0.456 lbs/day	187.5930 ug/l*	0.101 lbs/day
Toxephene	0.0113 ug/l*	0.000 lbs/day	7.2075 ug/l	0.004 lbs/day

Effluent Limitations for Protection of Human Health (Class 1C Waters)

	1 Hour Average (Acute) Standard	
Metals	**Concentration**	**Load**
Arsenic	0.00 ug/l	0.00 lbs/day
Barium	0.00 ug/l	0.00 lbs/day
Cadmium	0.00 ug/l	0.00 lbs/day
Chromium	0.00 ug/l	0.00 lbs/day
Lead	0.00 ug/l	0.00 lbs/day
Mercury	0.00 ug/l	0.00 lbs/day
Selenium	0.00 ug/l	0.00 lbs/day
Silver	0.00 ug/l	0.00 lbs/day
Fluoride	0.00 ug/l	0.00 lbs/day
to	0.00 ug/l	0.00 lbs/day
Nitrates as N	0.00 ug/l	0.00 lbs/day
Pesticides		
2,4-D	0.00 ug/l	0.00 lbs/day
2,4,5-TP	0.00 ug/l	0.00 lbs/day
Methoxychlor	0.00 ug/l	0.00 lbs/day

Effluent Limitations for Protection of Human Health [Toxics Rule]
Based upon Water Quality Standards (Most stringent of 1C or 3A & 3B as appropriate.)

	Maximum Conc., ug/l - Acute Standards			
	Class 1C		**Class 3A, 3B**	
Toxics Rule Parameters	[2 Liters/Day for 70 Kg Person over 70 Yr.		[6.5 g for 70 Kg Person over 70 Yr. Period]	
Antimony	0.00 ug/l	0.00 lbs/day	55.29 ug/l	0.0 lbs/day
Arsenic				
Beryllium				
Cadmium				
Chromium III				
Chromium VI				
Copper	0.00 ug/l	0.00 lbs/day	12835.31 ug/l	6.9 lbs/day
Lead				
Mercury		lbs/day	987.33 ug/l	0.5 lbs/day
Nickel	0.00 ug/l	0.00 lbs/day		
Selenium			73062.55 ug/l	39.4 lbs/day
Silver			1382.26 ug/l	0.7 lbs/day
Thallium	0.00 ug/l	0.00 lbs/day		

Zinc	0.00 ug/l	0.00 lbs/day	1875.93 ug/l	1.0 lbs/day
Cyanide	0.00 ug/l	0.00 lbs/day	0.50 ug/l	0.0 lbs/day
Asbestos	0.00 ug/l	0.00E+00 lbs/day	42.46 ug/l	0.0 lbs/day
0	0.00 ug/l	0.00 lbs/day		
2,3,7,8-TCDD Dioxin	0.00 ug/l	0.00 lbs/day	987.33 ug/l	0.5 lbs/day
Acrolein	0.00 ug/l	0.00 lbs/day	3.95 ug/l	0.0 lbs/day
Acrylonitrile	0.00 ug/l	0.00 lbs/day		
Benzene	0.00 ug/l	0.00 lbs/day		
Bromoform	0.00 ug/l	0.00 lbs/day	56.28 ug/l	0.0 lbs/day
Carbon Tetrachloride	0.00 ug/l	0.00 lbs/day		
Chlorobenzene	0.00 ug/l	0.00 lbs/day		
Chlorodibromomethane	0.00 ug/l	0.00 lbs/day	3.75 ug/l	0.0 lbs/day
Chloroethane	0.00 ug/l	0.00 lbs/day	69.11 ug/l	0.0 lbs/day
2-Chloroethylvinyl Ether	0.00 ug/l	0.00 lbs/day	4.94 ug/l	0.0 lbs/day
Chloroform	0.00 ug/l	0.00 lbs/day	3.36 ug/l	0.0 lbs/day
Dichlorobromomethane	0.00 ug/l	0.00 lbs/day	464.05 ug/l	0.3 lbs/day
1,1-Dichloroethane	0.00 ug/l	0.00 lbs/day		
1,2-Dichloroethane	0.00 ug/l	0.00 lbs/day	45.42 ug/l	0.0 lbs/day
1,1-Dichloroethylene	0.00 ug/l	0.00 lbs/day	1.68 ug/l	0.0 lbs/day
1,2-Dichloropropane	0.00 ug/l	0.00 lbs/day	9873.32 ug/l	5.3 lbs/day
1,3-Dichloropropene	0.00 ug/l	0.00 lbs/day	5.83 ug/l	0.0 lbs/day
Ethylbenzene	0.00 ug/l	0.00 lbs/day	24.68 ug/l	0.0 lbs/day
Methyl Bromide	0.00 ug/l	0.00 lbs/day	0.25 ug/l	0.0 lbs/day
Methyl Chloride	0.00 ug/l	0.00 lbs/day	799.74 ug/l	0.4 lbs/day
Methylene Chloride	0.00 ug/l	0.00 lbs/day	760.25 ug/l	0.4 lbs/day
1,1,2,2-Tetrachloroethane	0.00 ug/l	0.00 lbs/day	3751.86 ug/l	2.0 lbs/day
Tetrachloroethylene	0.00 ug/l	0.00 lbs/day	128.35 ug/l	0.1 lbs/day
Toluene	0.00 ug/l	0.00 lbs/day		
1,2 -Trans-Dichloroethylene	0.00 ug/l	0.00 lbs/day		
1,1,1-Trichloroethane	0.00 ug/l	0.00 lbs/day	2.67 ug/l	0.0 lbs/day
1,1,2-Trichloroethane	0.00 ug/l	0.00 lbs/day	207339.67 ug/l	111.8 lbs/day
Trichloroethylene	0.00 ug/l	0.00 lbs/day	13.82 ug/l	0.0 lbs/day
Vinyl Chloride	0.00 ug/l	0.00 lbs/day	6615.12 ug/l	3.6 lbs/day
2-Chlorophenol	0.00 ug/l	0.00 lbs/day		
2,4-Dichlorophenol	0.00 ug/l	0.00 lbs/day	81948.54 ug/l	44.2 lbs/day
2,4-Dimethylphenol	0.00 ug/l	0.00 lbs/day		
2-Methyl-4,6-Dinitrophenol	0.00 ug/l	0.00 lbs/day	0.04 ug/l	0.0 lbs/day
2,4-Dinitrophenol	0.00 ug/l	0.00 lbs/day	0.04 ug/l	0.0 lbs/day
2-Nitrophenol	0.00 ug/l	0.00 lbs/day	0.04 ug/l	0.0 lbs/day
4-Nitrophenol	0.0000 ug/l	0.0000 lbs/day		
3-Methyl-4-Chlorophenol	0.0000 ug/l	0.0000 lbs/day	0.04 ug/l	0.000 lbs/day
Penetachlorophenol	0.0000 ug/l	0.0000 lbs/day		
Phenol	0.0000 ug/l	0.00E+00 lbs/day	0.30 ug/l	0.000 lbs/day
2,4,6-Trichlorophenol	0.0000 ug/l	0.0000 lbs/day	13822.64 ug/l	7.450 lbs/day
Acenaphthene	0.00 ug/l	0.00 lbs/day		
Acenaphthylene	0.00 ug/l	0.00 lbs/day	14809.98 ug/l	8.0 lbs/day
Anthracene	0.00 ug/l	0.00 lbs/day	9873.32 ug/l	5.3 lbs/day
Benzidine	0.00 ug/l	0.00 lbs/day		
BenzoaAnthracene	0.00 ug/l	0.00 lbs/day	0.04 ug/l	0.0 lbs/day
BenzoaPyrene	0.00 ug/l	0.00 lbs/day	0.0 ug/l	0.0 lbs/day
BenzobFluoranthene	0.00 ug/l	0.00 lbs/day	4146.79 ug/l	2.2 lbs/day
BenzoghiPerylene	0.00 ug/l	0.00 lbs/day	3159.46 ug/l	1.7 lbs/day
BenzokFluoranthene				
Bis2-ChloroethoxyMethane				

Bis2-ChloroethylEther	0.0000 ug/l	0.00000 lbs/day	1.68E+05 ug/l	9.05E+01 lbs/day
Bis2-Chloroisopropy1Ether	0.0000 ug/l	0.00E+00 lbs/day	2.67E+06 ug/l	1.44E+03 lbs/day
Bis2-EthylbexylPhthalate	0.0000 ug/l	0.00000 lbs/day	######### ug/l	10.64344 lbs/day
4-Bromophenyl Phenyl Ether	0.0000 ug/l	0.00000 lbs/day	1.08606 ug/l	0.00059 lbs/day
Butylbenzyl Phthalate	0.0000 ug/l	0.00E+00 lbs/day		
2-Chloronaphthalene	0.0000 ug/l	0.00000 lbs/day		
4-Chlorophenyl Phenyl Ether	0.0000 ug/l	0.00000 lbs/day	0.35544 ug/l	0.00019 lbs/day
Chrysene	0.0000 ug/l	0.00000 lbs/day	######### ug/l	0.69182 lbs/day
Dibenzoa, hAnthracene	0.0000 ug/l	0.00000 lbs/day	######### ug/l	5.85389 lbs/day
1,2-Dichlorobenzene	0.0000 ug/l	0.00000 lbs/day	0.00276 ug/l	0.00000 lbs/day
1,3-Dichlorobenzene	0.0000 ug/l	0.00000 lbs/day	4.34426 ug/l	0.00234 lbs/day
1,4-Dichlorobenzene	0.0000 ug/l	0.00000 lbs/day	13.82264 ug/l	0.00745 lbs/day
3,3-Dichlorobenzidine				
Diethyl Phthalate				
Dimethyl Phthalate				
Di-n-Butyl Phthalate	0.00000 ug/l	0.00000 lbs/day		
2,4-Dinitrotoluene	0.00000 ug/l	0.00000 lbs/day	######### ug/l	0.090469 lbs/day
2,6-Dinitrotoluene	0.00000 ug/l	0.00000 lbs/day	0.006813 ug/l	0.000004 lbs/day
Di-n-Octyl Phthalate	0.00000 ug/l	0.00000 lbs/day	0.049367 ug/l	0.000027 lbs/day
1,2-Diphenylhydrazine	0.00000 ug/l	0.00000 lbs/day	32.581948 ug/l	0.017562 lbs/day
Fluoranthene	0.00000 ug/l	0.00000 lbs/day		
Fluorene	0.00000 ug/l	0.00000 lbs/day	8.19E+03 ug/l	4.42E+00 lbs/day
Hexachlorobenzene				
Hexachlorobutedine				
Hexachloroethane	0.00 ug/l	0.00 lbs/day		
Hexachlorocyclopentadiene				
Ideno 1,2,3-cdPyrene				
Isophorone	0.00 ug/l	0.00 lbs/day		
Naphthalene				
Nitrobenzene				
N-Nitrosodimethylamine	0.00 ug/l	0.00 lbs/day		
N-Nitrosodi-n-Propylamine	0.00 ug/l	0.00 lbs/day	0.00 ug/l	0.0 lbs/day
N-Nitrosodiphenylamine	0.00E+00 ug/l	0.00E+00 lbs/day		
Phenanthrene	0.00 ug/l	0.00 lbs/day	612.15 ug/l	0.3 lbs/day
Pyrene	0.00 ug/l	0.00 lbs/day		
1,2,4-Trichlorobenzene			612.15 ug/l	0.3 lbs/day
Aldrin			0.58 ug/l	0.0 lbs/day
alpha-BHC	0.00000000 ug/l	0.000000 lbs/day		
beta-BHC	0.00000000 ug/l	0.000000 lbs/day		
gamma-BHC (Lindane)	0.00000000 ug/l	0.000000 lbs/day		
delta-BHC		0.000000 lbs/day		
Chlordane	0.00000000 ug/l	0.000000 lbs/day		
4,4-DDT	0.00000000 ug/l	0.000000 lbs/day		
4,4-DDE	0.00000000 ug/l	0.000000 lbs/day		
4,4-DDD	0.00000000 ug/l	0.000000 lbs/day		
Dieldrin		0.000000 lbs/day		
alpha-Endosulfan	0.00 ug/l	0.000 lbs/day		
beta-Endosulfan	0.00 ug/l	0.000 lbs/day		
Endosulfan Sulfate	0.00 ug/l	0.000 lbs/day		

Endrin	0.00000000 ug/l	0.000 lbs/day		
Endrin Aldehyde	0.00000000 ug/l	0.000 lbs/day		
Heptachlor		lbs/day		
Heptachlor Epoxide		lbs/day		
Polychlorinated Biphenyls		lbs/day		
0	0.00000000 ug/l	0.000000 lbs/day		
Toxaphene	0.00000000 ug/l	0.000000 lbs/day		
Specific Parameter: TDS	0 ug/l	0.000000 lbs/day	8431.75 mg/l	4.5 tons / day

Effluent Limitations for the Protection of Agriculture

	1 Hour Average (Acute) Standard Concentration	Load
Arsenic	987.33 ug/l	0.53 lbs / day
Boron	7404.99 ug/l	3.99 lbs / day
Cadmium	98.73 ug/l	0.05 lbs / day
Chromium	987.33 ug/l	0.53 lbs / day
Copper	493.67 ug/l	0.27 lbs / day
Lead	987.33 ug/l	0.53 lbs / day
Selenium	493.67 ug/l	0.27 lbs / day

Metals Effluent Limitations for Protection of All Beneficial Uses Based upon Water Quality Standards and Toxics Rules

	Class 4 Acute Agricultural ug/l	Class 3 Acute Aquatic Wildlife ug/l	Acute Toxics Drinking Water Source ug/l	Acute Toxics Wildlife ug/l	1C Acute Health Criteria ug/l	Acute Most Stringent ug/l	Class 3 Chronic Aquatic Wildlife ug/l
Aluminum		7242.61				7242.61	3894.28
Antimony			0.00			0.00	
Arsenic	987.33	3323.21			10.00	10.00	8252.25
Asbestos							
Barium		9873.32			1000.00	1000.00	
Boron							
Cadmium	98.73	40.83			0.00	0.00	12.27
Chromium (III)		10341.5			50.00	50.00	5519.41
Chromium (VI)	987.33	124.43				124.43	411.12
Copper	493.67	256.56				256.56	825.67
Cyanide		217.21		0.00		0.00	51.34
Iron		168.41				168.41	
Lead	987.33	1459.40			15.00	15.00	182.38
Mercury		23.6693			0.00	0.00	0.5108
Nickel		8758.97		0.00		0.00	4169.22
Selenium	493.67	171.46			50.00	50.00	195.80
Silver		90.06			0.00	0.00	
Thallium				0.00		0.00	
Zinc		2115.80				2115.80	92442.18

Summary Effluent Limitations for Metals [Wasteload Allocation, TMDL]

	Acute		Chronic	
	ug/l	lbs/day	ug/l	lbs/day
Aluminum	7242.61	6.0	3894.28	3.2
Antimony				
Arsenic	10.00	0.0	8252.25	6.9
Asbestos				
Cadmium	0.00	0.0	12.27	0.0
Chromium (III)	50.00	0.0	5519.41	4.6
Chromium (VI)	124.43	0.1	411.12	0.3
Copper	256.56	0.2	825.67	0.7
Cyanide	0.00	0.0	51.34	0.0
Iron	168.41	0.1		
Lead	15.00	0.0	182.38	0.2
Mercury	0.00	0.0	0.51	0.0
Nickel	0.00	0.0	4169.22	3.5
Selenium	50.00	0.0	195.80	0.2
Silver	0.00	0.0		
Zinc	2115.80	1.8	92442.18	77.1

Effluent Indicators / Targets for Pollution Indicators

Water quality targets for pollution Indicators will be met with an effluent limit as follows:

	Indicator / Target	Target	
	mg/l	mg/l	lbs/day
Gross Beta (pCi/l)	50.0 pCi/L		
BOD	5.0	49.37	15012.29
Nitrates as N	4.0	39.49	12009.83
Total Phosphorus as P	0.05	0.49	150.12
Total Suspended Solids	90.0	888.60	270221.22

Other Effluent Limitations are based upon R317-1.

X. Antidegradation Considerations

The Utah Antidegradation Policy allows for degradation of existing quality where it is determined that such lowering of water quality is necessary to accommodate important economic or social development in the area in which the waters are protected [R317-2-3]. It has been determined that development in the area in which the waters are protected [R317-2-3]. It has been determined that certain chemical parameters introduced by this discharge will cause an increase of the concentration of said parameters in the receiving waters. Under no conditions will the increase in concentration be allowed to interfer with existing water users.

Category III waters fall under special rules for the determination of effluent limits. These rules allow more stringent effluent limitations based upon additional factors, including: "blue-ribbon" fisheries, special recreation areas, and drinking water sources.

XI. Colorado River Salinity Forum Considerations

Discharges in the Colorado River Basin are required to have their discharge at a TDS loading of less than 1.00 tons/day unless shown that this is not attainable. Refer to the Forum's Guidelines for additional information.

The permit writers may utilize other information to adjust these limits and/or to determine other limits based upon best available technology and other considerations.

XII. Summary Comments

The mathematical modeling and best professional judgement indicate that violations of receiving wataer benefical uses with their associated water quality standards, including important downstream segments, will not occur for the evaluated parameters of concern as discussed above if the effluent limitations indicated above are met.

The permit writers may utilize other information to adjust these limits or to determine other limite based upon best available technology and other considerations. Under no circumstances however, may those alterations allow for the violation of water quality standards by the permitee.

XIII. Notice of UPDES Requirement

This Addendum to the Statement of Basis does not authorize any entity or party to discharge to the waters of the State of Utah. That authority is granted through a UPDES permit issued by the Utah Division of Water Quality. The numbers presented here may be changed as a function of other factors. Dischargers are strongly urged to contact the Permits Section for further information.

XIV. Notice of Availability of Information

All model numerical inputs, intermediate calculations, outputs and graphs are available for discussion, inspection and copy at the Division of Water Quality.

Prepared by:
David Wham
Utah Division of Water Quality
801-536-4337

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